



13 November 2023

Sea Shepherd Australia Submission on Offshore Renewable Energy Development in the Illawarra Region

The Offshore Renewable Energy Team
Department of Climate Change, Energy, the Environment and Water
Canberra ACT 2601

Dear Team

Thank you for the opportunity to provide a submission about the proposal for the Minister to declare an identified area in the Illawarra region of Australia under Part 2 of the *Offshore Electricity Infrastructure Act 2021 (the Act)*. We understand the importance of offshore wind (OSW) as a renewable energy source.

Here is **short executive summary** of this submission

1. Sea Shepherd Australia (SSAU) starts from a position that our changing climate is one of the greatest planetary challenges currently being faced, and which impacts all species. On balance, SSAU is prepared to support the use of technologies and methods of OSW construction and operation that avoid and/or minimise adverse impacts on marine life as well as birds and bats transiting the OSW areas but this must be carefully considered on a site by site basis. **In the Illawarra we submit that further research on the possible effects on marine mammals of an OSW farm of this magnitude should be undertaken before this declaration is made.**
2. **If the declaration is made, we submit that of the principles listed below and previously provided to the Department, the most important are:**
 - a) **The need to adopt a precautionary approach¹** when considering whether to declare the Illawarra zone as a suitable area for offshore wind under Part 2 of the Act and any conditions that might apply to that declaration under s. 20 of the Act. A precautionary approach must also be taken when deciding whether the environmental risks are acceptable or not; and

¹ The precautionary approach: Principle 15 of the 1992 United Nations "Rio Declaration on Environment and Development" states that "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation".

https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf

The precautionary approach, while introduced into the UN in 1992, is also enshrined within the principles of ecologically sustainable development in S 3A of the Environment Protection and Biodiversity Conservation (EPBC) Act 1999, and Chapter 6, Part 16 -Precautionary principle and other considerations in making decisions

3A(b): if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

- b) it is more effective for marine life to avoid an impact than to minimise or mitigate it. SSAU therefore submits that a careful consideration of any possible adverse effect on marine mammals particularly on those using the identified migration corridor is essential before any licences are issued.
3. The Australian East Coast Migration Corridor has been recognised as an important marine mammal area (IMMA) for the Humpback whale and other marine species. The potential whale migration path through this proposed zone is considerable. On an assumption of floating wind turbines with catenary mooring lines being the preferred installation method in the Illawarra, there is likely to be a considerable network of lengthy underwater cables and lines (see detailed assumptions and analysis below) and there is no research about what might happen to whales that might encounter this network, or their behaviour to seek to avoid this structure in their path. The need for research about this is urgent particularly as floating technology has not yet been deployed anywhere else in the world at commercial scale.
 4. This alone may be a good reason to move the inner boundary of the zone further out to sea to broaden the migration corridor (noting also that Blue Float Energy have indicated their closest turbine would be 14 km from shore).
 5. SSAU also suggests that the Minister should follow an iterative approach to development using conditions and licensing scheme parameters to test its assumptions about risk before authorising expansion of the zone area or additional licensing.
 6. Based on the early behaviour of some potential applicants it is submitted that there is evidence supporting a need for more direct regulation of applicants for licences under Chapter 3 of the Act (Licensing) (in addition to the existing Guidelines) and careful consideration of possible conditions (see below under Regulation) that might be made that apply to a declaration of the area under Part 2 of Chapter 2 of the Act. The legislative scheme under the Act contains sufficient flexibility to regulate for specific objectives. For example, feasibility licences are intended to provide for a competitive process where applications will be assessed against suitability and merit criteria. This provides an opportunity for the Minister to set criteria to strongly indicate to an applicant that meeting some or all of its guidelines will be considered important and may be decisive.

Statement of Position

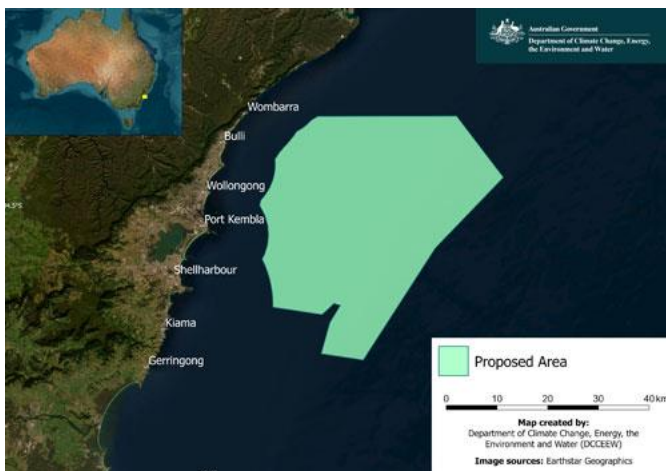
Our position on OSW has been previously provided and is summarised below:

- SSAU supports the scientific consensus regarding the impacts of human-induced climate change; the outcomes of the Paris Agreement; and the need for a rapid transition from fossil fuels to energy generated from renewable sources.
- SSAU fully recognises the adverse impacts of climate change on our oceans and the marine life that inhabit them.
- SSAU believes that all creatures have the same rights to an intrinsic quality of life on our shared planet.
- SSAU recognises the rise of offshore wind as a renewable energy source but believes this must not be at the expense of sustainability and protection of the surrounding marine environment.
- SSAU acknowledges that everything that humans do has an environmental footprint.
- SSAU understands that there are several methods of constructing offshore wind farms. Some methods are more destructive to the marine environment than others.
- SSAU supports the methods of construction and operation of offshore wind farm that minimises adverse environmental impacts on marine life and birds, while at the same time provides local economic benefits.

- SSAU acknowledges that noise-intensive installation methods will harm marine life. In order to protect the surrounding marine environment of offshore wind farms, it is necessary to reduce this sound input into the ocean.
- SSAU acknowledges that it is more advantageous for marine life to avoid an impact than to minimise or mitigate it. SSAU therefore supports the use of “quiet foundation technologies” during construction of offshore wind farms and **opposes** noisy construction methods such as **pile-driving**.
- SSAU supports the use of technologies that minimise the generation of carbon emissions from inspection and maintenance activities, such as robotics.
- SSAU believes that it is of utmost importance for effective mechanisms to be developed to assess the cumulative impacts of multiple offshore wind farms with larger turbines on the marine environment which have yet to be adequately determined.
- SSAU urges everyone involved in offshore wind developments to always adopt a precautionary approach² when planning, constructing, operating and decommissioning offshore wind farms.
- SSAU also recognises that some areas in our oceans are too sensitive for human development and should therefore not be considered for offshore wind production or development of any kind.

The Proposed Illawarra zone

The proposed renewable energy zone in the Illawarra stretches over 1461 km² off the coast from Gerringong in the south to Wombarra in the north with the city of Wollongong and port of Port Kembla in the centre of the proposed zone. It is closest to the coast off Wollongong (10 km) and this distance from the coast is similar north from there to the top of the zone at Wombarra. It is suggested in the documentation that it could generate up to 4.2GW of wind energy.



A number of companies have expressed interest in establishing wind turbines in the Illawarra but for the purposes of this submission, it is not necessary to look at each in detail as this will occur later on and things will inevitably change in this dynamic commercial environment³. However using recent data provided by South Pacific we have made some observations.

² Loc cit

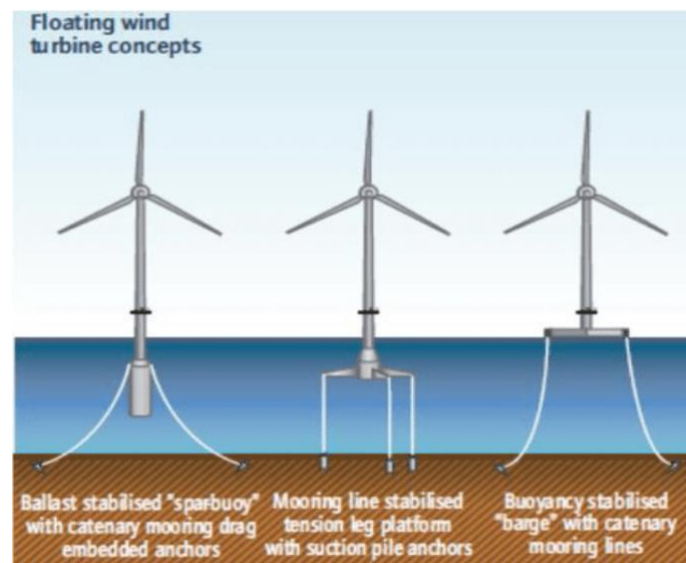
³ Illawarra Mercury reporting that Blue Float Energy are withdrawing their referral to the EPBC Act. 7 November 2023. See Blue Float Energy withdraws plans from environmental approvals process at https://www.illawarramercury.com.au/story/8414269/bluefloat-withdraws-submission-days-after-outlining-plans-for-105-illawarra-turbines/?utm_source=sfmc&utm_medium=email&utm_campaign=var1:breaking_news+var2:title&utm_source=sfmc&utm_medium=email&utm_campaign=

At a public meeting in Wollongong in July 2023, South Pacific (Blue Float Energy) indicated that it would like to install 105 floating wind turbines between Shellharbour and Clifton situated 14-30 km off the coast. They suggested this would generate up to 1.575 GW of wind energy. The turbines would be located in **water depths between 130 m and 250 m**. And onshore grid connection would occur at the 330V Dapto switchyard.

If the proposed Illawarra OSW zone were to generate 4.2GW of wind energy as suggested by Government, then extrapolating these figures indicates that there could be up to 280 floating wind turbines in this zone and possibly three operators.

According to Blue Float Energy, each wind turbine will have a capacity between 15 MW and 20 MW, hub heights between 165 m and 190 m and rotor diameters of 250 m to 275 m.

And each turbine will need to be fastened to the sea floor.



This diagram shows some alternative options for securing floating platforms⁵.

Mooring systems come with their own challenges⁶:

According to Offshore Wind Market Report: 2021 Edition ii, in 2020 alone the global floating offshore wind capacity grew by more than three times, from 7663 MW (2019) to 26,529 MW [4]. This higher wind energy density brings with it new challenges for the offshore wind industry, particularly the mooring system [2,3]. **One of the main challenges with mooring systems is their high rate of failure**, as experienced in the oil and gas industry with 296 mooring system accidents in a roughly 40-year period [5], and an annual probability of failure during 2001–2011 estimated at 3.0×10^{-3} [6]. Similar challenges exist with respect to FOWT, and further comprehensive studies based on specific FOWT properties are required[2].

⁴ Slides from Bluefloat Energy Public presentation at Wollongong on 27 July 2023.

⁵ From Offshore Wind Foundations: Acoustic Impacts and Environmental protection by Katarina Hallden Seatower, Norway (provider of foundations for OSW).

⁶ Yang, Ray-Yeng & Chuang, Tzu-Ching & Zhao, Chenyu & Johanning, Lars. (2022). Dynamic Response of an Offshore Floating Wind Turbine at Accidental Limit States—Mooring Failure Event. Applied Sciences. 12. 1525. 10.3390/app12031525. accessed 7 November 2023 at https://www.researchgate.net/publication/358259379_Dynamic_Response_of_an_Offshore_Floating_Wind_Turbine_at_Accidental_Limit_States-Mooring_Failure_Event/citation/download

Current offshore floating wind projects such as the spar type foundation (Hywind Scotland Hywind Tampen TODA Hybrid Spar semi-submersible foundation (WindFloat Atlantic 'Fukushima FORWARD, and Voltur-nUS Aqua Ventus I) all apply a **three-leg catenary mooring system** due to its simple design and installation

Even with the Illawarra wind turbines being in deeper water it seems likely that this will be the preferred mooring system although various technologies could be applied. The weather phenomenon the 'East Coast Low' is notorious in the Illawarra for bringing in large storms with high seas from the south. Platforms will need to move about in these storms.

South Pacific Offshore Wind Project (Bluefloat) state in their EPBC Act application⁷:

A combination of tug boats and/or construction service vessels will install anchors and the mooring lines for the floating WTGs and substations (this may include technology such as drag anchors, or suction caissons, or drilled and grouted piles with the final design subject to ongoing investigations). Mooring lines may require pre-tensioning (stretching) by one or more vessels.

It should be noted that the footprint size of such a catenary or curved mooring system is relatively large as illustrated in the table below.⁸

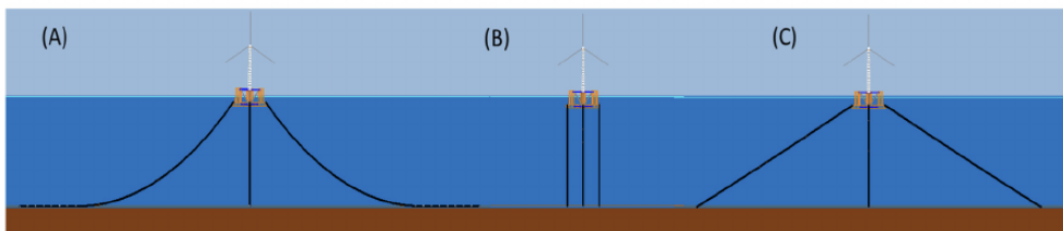


Figure 1. Three types of mooring systems: (A) Catenary mooring system, (B) Tension-leg mooring system, (C) Semi-taut mooring system.

Table 1. Comparison of the three mooring systems [7,9,10].

Types Item	Catenary Mooring System	Tension-Leg Mooring System	Semi-Taut Mooring System
Platform stability (without mooring system)	relatively high	relatively low	medium
Platform performance (with mooring system)	acceptable	relatively stable	acceptable
Pre-tension of mooring system	relatively low	relatively high	medium
Footprint size of mooring system	relatively large	relatively small	medium
Installation of mooring system	relatively simple compared to a tension-leg mooring system	relatively difficult compared to catenary and semi-taut mooring systems	relatively simple compared to a tension-leg mooring system

These mooring lines could be between 180 and 350 metres long in 130-250 metre depth of water (based on an isosceles triangle) and with at least three per turbine required there could be conservatively at least 300 of these mooring lines based on an assumed initial installation of 105 turbines. These would have to be avoided or successfully navigated through by migrating marine mammals.

⁷ Application Number 01569 – South Pacific Offshore Wind Project – EPBC Act Business Portal.

⁸ Ibid page 2 of 25.

Marine Mammals

The Marine Mammal Protected Areas Taskforce (MMPAT), an international body created by the International Union for the Conservation of Nature (IUCN), have identified the Australian East Coast Migration Corridor as an important marine mammal area (IMMA) for the Humpback whale – *Megaptera novaeangliae* and the Dwarf minke whale – *Balaenoptera acurostrata* ssp. with broader Marine Mammal Diversity identifying many other species (including southern right whales, dolphins and orcas).

The MMPAT factsheet on this corridor states⁹

This is the core migratory corridor for east Australian humpback whales. This population is genetically distinct from surrounding populations in Western Australia and Oceania (Schmitt et al. 2014, Rosenbaum et al. 2017). The whales migrate northwards from May to August and southwards from August to November (Dawbin, 1966; Paterson et al., 1994; Noad et al., 2019). Although some whales merge with and split from the migratory corridor along its length, a large proportion of the population likely uses the majority of the corridor.

The Australian East Coast Migration Corridor map¹⁰ shows the identified corridor meeting the IMMA Selection Criteria, and a broader 'advised buffer' area suggested for use in the development of appropriate place-based conservation measures. The proposed Illawarra ORED would seem to be within both of these areas thereby putting Government on notice of the need to have in place appropriate conservation measures if and when the OSW farm develops.

The number of whales using this marine corridor is considerable. The IMMA indicates that 'the population of humpback whales has recovered from the time of the whaling industry with a rapid and consistent rate of increase of 10-11% per annum since dedicated surveys began in the early 1980s and there are now likely to be in excess of 30,000 whales in the population. This figure may be as high as 40,000 as estimated recently by Wally Franklin from the Oceania Project¹¹. He notes that 'the numbers are now getting close to what we call carrying capacity, when the number of whales born equals the number of whales that die of natural causes each year', all the more reason to take a precautionary approach to the effect that OSW development may have on marine life using the east coast migration corridor.

Commonwealth Marine Area

The proposed offshore zone is within the Commonwealth Marine Area as defined in the EPBC Act. As South Pacific Offshore Wind Project indicate in their EPBC Act application¹²:

Direct or indirect impacts on the Commonwealth Marine Area that could theoretically occur from construction and/or operation of the Project include:

- unplanned spills/pollution events changes to hydrodynamics
- introduction of pest species
- dropped objects from vessels and installation platforms
- cable laying (or removal) and piling activity resulting in water and sediment quality impacts artificial lighting pollution
- underwater noise and vibration discharges from vessels.

⁹ At <https://www.marinemammalhabitat.org/portfolio-item/australian-east-coast-migration-corridor/>

¹⁰ Loc. cit.

¹¹ See <https://www.abc.net.au/news/2023-10-22/east-coast-humpback-whale-population-record-high-experts-say/102990590>

¹² Op. Cit 7 para 4.1.7.2.

The application states¹³ that 'Impacts including underwater noise, potential for entanglement or lighting pollution may cause some avoidance behaviour in individual marine species or cetacean individuals'.

Re-inforcing the submission that the Minister should proceed in a precautionary way is supported by the South Pacific Offshore Wind Project EPBC Act application itself where it is admitted that:

With appropriate controls in place, the impacts described above are considered to present a medium risk, which is localised. Infrastructure and associated works are unlikely to have a 'substantial' or 'persistent' adverse impact on the Commonwealth marine environment. However, **there is a possibility that the Project may result in an adverse effect on cetaceans** (although this is unlikely to be substantial). As the design is continuing to develop and evolve, at this early stage in the assessment process as a conservative approach, **it is assumed that impacts to Commonwealth Marine Areas have the potential to be significant**¹⁴.

We don't know how a whale population of this size is likely to fare when passing through or around this cluster of mooring lines together with the cables to floating sub-stations, and and to shore that will carry the energy created by the turbines. Noise, turbidity, electromagnetic fields are all also possible threats/risks to marine mammals.

It has been suggested by some academics that whales will be able to navigate successfully through or around these cables and lines but there is no precedent elsewhere in the world for this number of whales passing this number of lines at these depths.

We know that the tagged whales south of Eden NSW spread out in various directions and also that whales take quite different paths when travelling north in the winter from when they return in the spring often closer to shore with newborns in tow¹⁵. It seems more than likely that some will find themselves in the areas of these lines and cables. It is suggested that the precautionary approach would see turbines installed as part of an iterative process whereby the environmental effect of a specific number of installed turbines could be tested before permission was provided to install further turbines. SSAU notes the power of Government in the Act to vary declared areas and attach conditions to any declaration.

A priority would seem to be to undertake research to establish the patterns of whale migration and their distance from shore in the Illawarra before approving any turbine installations. Perhaps Government could fund this research through the University of Wollongong.

It is noted that the Minister, when announcing the consultation period, noted in his media release that the proposed Illawarra Offshore Zone area "took into account existing concerns regarding impacts to tourism, whale migration paths, birdlife and fishing". But these are matters that are required to be taken into account not just once in the conceptualisation of this scheme but also at each critical decision making point based on the latest relevant information.

The literature from the USA seems to indicate that no whale deaths have been caused by OSW and that strikes by ships and entanglement in fishing nets are a greater threat to whales than OSW activity¹⁶, but the circumstances in the Illawarra are unique and must be treated as such.

Regulation

We note that DCCEEW released environmental guidelines¹⁷ that include many of the issues and risk solutions provided in our previous submission, including:

¹³ Loc. Cit.

¹⁴ Op.Cit. 7 Paragraph 4.1.7.5 of the Application

¹⁵ Op. Cit 9 diagram at end of fact sheet

¹⁶ <https://e360.yale.edu/features/humpback-whale-strandings-u.s.-east-coast>

¹⁷ [Key environmental factors for offshore windfarm environmental impact assessment under the Environmental Protection and Biodiversity Conservation Act 1999 - DCCEEW](#)

- Recognition of both the *precautionary principle* and *impact mitigation hierarchy*
- Use of ‘quiet’ technology such as gravity-based foundations (GBF) for mooring lines
- Use of bird-strike risk mitigation

However we also note that Star of the South (Gippsland, Victoria) have recently indicated¹⁸ that they intend using monopile foundations despite these being the noisiest installation method and generating far fewer local jobs than using a gravity based bottom foundation approach. This would seem to provide evidence that Government may have to use more direct regulatory approaches than guidelines to achieve appropriate environmentally sound processes as the OSW industry advances.

There seem to be a number of opportunities in the regulatory system to take up these issues as conditions of the declared area that allows the Minister to control the kinds of offshore infrastructure activities permitted in a declared area¹⁹ or in the design of the licensing scheme particularly for feasibility licences in Division 2 of Chapter 3 of the Act. Feasibility licences are intended to provide for a competitive process where applications will be assessed against suitability and merit criteria²⁰.

For example the Minister could either invite applications for a feasibility licence to build a windfarm with conditions already in place under the area declaration or in the feasibility licensing scheme. The licensing scheme could for example indicate that where the Minister is choosing between competing applicants for a licence it will weight certain criteria more heavily than others. e.g. those that provide the least amount of environmental disruption in its installation or are designed to best follow the existing government guidelines.

Possible conditions could limit the times of year when installation of underwater objects can occur or underwater works are able to be carried out to ensure these are outside the times when whales are migrating north or south.

Another possible condition might encourage accountability for developers by requiring maximum noise levels during construction that the developers are committed not to exceed. These levels could be the noise levels the developers themselves state in their environmental impact assessments (EIAs) for the offshore wind farms. These underwater noise levels would be monitored in accordance with international standards for noise measurements during the construction and construction would immediately be stopped in case of excessive noise. SSAU understands that this approach has occurred in the US.

It is submitted that this declaration decision, the condition making power and setting the selection and merit criteria for the feasibility licence(s) presents a prime opportunity for the Minister to encourage those applicants that have the best proposals to discharge their environmental responsibilities. It is not sufficient to just leave these issues to the EPBC Act particularly as that Act was severely criticised in the Samuels review and is currently undergoing a rewrite.

The EPBC Act only considers species classified as critically endangered, endangered, vulnerable and migratory, and excludes marine animals not in those categories that call the oceans their home. These are equally vulnerable and at risk of the adverse impacts of uncontrolled OSW development.

This submission does not discuss the potential impacts of electromagnetic emissions, and the impacts on birds and bats of wind turbines and their rotating blades during the operation of an OSW farm. However, these have been included in the DCCEEW guidelines.

Rather conveniently, Table 7.1 of the BMT assessment (for Southern Winds Offshore Winds Project) lists “Potential Impacts to Critically Endangered or Endangered Species known to, or likely to occur,

¹⁸ Star of the South website. <https://www.starofthesouth.com.au/offshore-wind> accessed 7 November 2023

¹⁹ Paragraph 59 of the Explanatory Memorandum to the Act

²⁰ Paragraph 108 of the Explanatory Memorandum to the Act.

within the Study Area” with the impact on 15 of these species considered “potentially significant”, including birds, bats and marine creatures.

Under the EPBC Act, a significant impact is defined as ‘an impact which is important, notable, or of consequence, having regard to its context or intensity’. Whether or not an action is likely to have a significant impact depends on the sensitivity, value and quality of the environment that is impacted, and upon the intensity, duration, magnitude and geographic extent of the impact. South Pacific are proceeding on the basis that impacts to Commonwealth Marine Areas have the potential to be significant. The Minister needs to do so also and do whatever is possible to minimise or to avoid these impacts.

If there is scientific uncertainty about the impacts of an action, and potential impacts are serious or irreversible, the **precautionary principle** is applicable. A lack of scientific certainty will not itself justify a decision that an action is not likely to have a significant impact on the environment.

Environmentally, the Illawarra region is a highly sensitive area and one that should be approached with extreme caution if OSW development is allowed to proceed. The Government must acknowledge the risks associated with improper development and, ideally, only proceed if satisfied that the risks can be adequately managed.

Please contact the undersigned should you have any queries.

Yours faithfully,




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About Sea Shepherd:

Sea Shepherd is an international, non-profit marine conservation organization that campaigns to defend, conserve and protect the world’s oceans and the wildlife that inhabit them.